

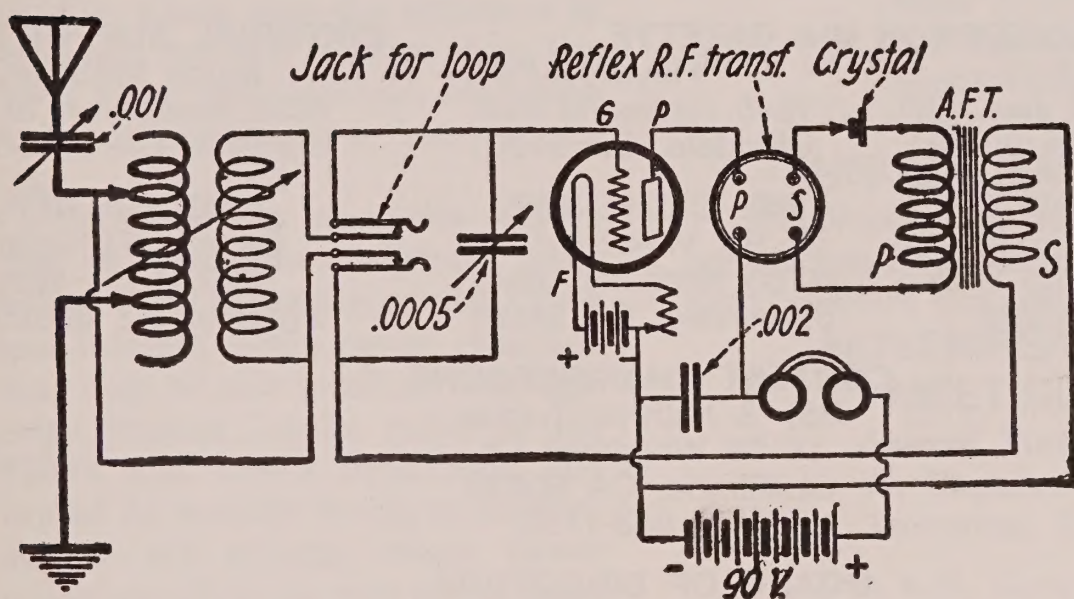
California Antique Radio Gazette

Official Journal, Southern California Antique Radio Society.

VOLUME 13

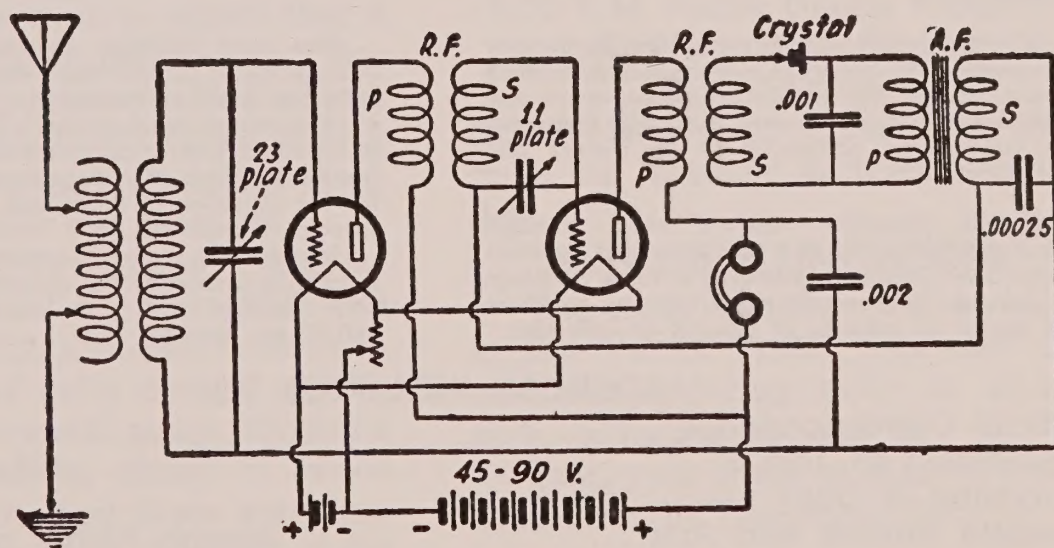
NOVEMBER 1988

NUMBER 4



(240) Remarkable Results Are Claimed for the "Erla Duo-Reflex" Circuit, Shown Here. Only One Tube is Used for Two Stages of Amplification.

(237) The Two Tube Erla Reflex Circuit Will Give Ample Volume with a Loud Speaker for All but the Most Distant Stations.



SOUTHERN CALIFORNIA ANTIQUE RADIO SOCIETY

Incorporated, Non-profit Organization

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Mike Adams, Mary Curry, Walter Curry, George Fathauer, Joe Knight, Bruce McCalley, Morgan McMahon, Floyd Paul, Edward Sheldon, Alan Smith, and Bill Wakefield.

SCARS is a non-profit organization. Its purpose is to preserve the history of wireless communication by encouraging the acquisition, preservation and exhibition of antique wireless and radio apparatus and publications pertaining to its history and development.

SCARS promotes contacts social through meetings held four times a year at various locations in Southern California. Featured at these meetings are contests, swap sessions and talks by members and guests on subjects of interest to collectors.

The club publishes quarterly the *California Antique Radio Gazette* which features news of club activities, hints on restoration, and advertisement of radio related items available for sale or trade. It is furnished free to all members. Ads are printed free for members. SCARS assumes no responsibility for the condition of items sold at swap meets or through *Gazette* ads.

Membership is open to anyone having a genuine interest in preserving the equipment and history of early wireless and radio equipment. Dues are \$10.00 per calendar year.

ADDRESS INQUIRIES TO:

Official Correspondence	Mike Adams
Application to Join	Edward Sheldon
Submittal of Dues	Mary Curry
Gazette Articles and Ads	Joseph Knight or Floyd Paul

The opinions expressed in the *Gazette* are those of the authors and may not reflect the opinions of the editors or the SCARS membership.



PRESIDENT'S MESSAGE

It is an exciting time for our hobby, a time of rapid change. While we have grown to over 600 members, national interest has grown by thousands, with a high quality national periodical (ARC) and new books on historical radio coming out weekly. Along with the explosion in local and national interest there has been some philosophical discussion on what constitutes a "real" collector.

Some of our members believe that only wireless equipment made before WWI is worthy of their time and interest, while newer collectors may only be able to afford broadcast sets. Because Catalin radios of the 1930's and 1940's have been embraced by wealthy young professionals as art objects, many newer collectors will never own one of these high-priced gems. Have you tried to buy a 1950's transistor set lately? Why there is even a report that a midwest antique radio dealer has been painting common 1940's black and brown sets bright colors to look more like the more desirable ones. Free enterprise run rampant.

Obviously, we as a collecting community must rise above it all and let anyone with a sincere interest in the history of radio devices participate. There are still many affordable things to collect, there is much research to do, and there are more books to be written. Because of the growth in membership there exists an even greater chance for you to effect the future of our hobby by

getting involved in SCARS. We are always looking for new people to serve as officers and directors, to give time to the club and effect its future.

I would like to continue as president but I have moved out of the area. My faculty position at Cal State Fullerton has always been temporary, and at this time of my life, tenure is desirable. For this reason, I have accepted a position as a tenure-track professor at San Jose State University. I'll return for a final 1988 meeting in Torrance. See you there.

Mike Adams
112 Crescent Ct.
Scotts Valley, CA 95066
(408) 439-9544

ANNOUNCEMENTS

The November Meeting will have nomination and election of Officers and Directors for 1989.

NOVEMBER 19 MEETING

Velvet Turtle
3210 W. Sepulveda Blvd.
Torrance, CA

7-11 A.M. Swapmeet
10:30-11 Contest
Noon Luncheon
1:00 P.M. Radio Drama Program
2:00 Election of Officers
2:30 Adjourn

Note: The Velvet Turtle may not open the restroom facilities until 10 A.M.

ANNUAL LUNCHEON

The annual luncheon will be held at the Velvet Turtle. The cost to members ordering early is \$9.95 each, including tax and tip.

Send your check to Mary Curry, Treasurer, by November 14th.

NOTICE

Only SCARS members may sell at SCARS meets.

THE EARLY YEARS of LOS ANGELES RADIO MANUFACTURING COMPANIES

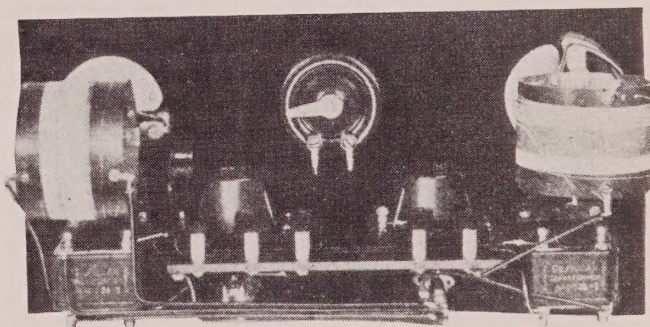
By F. A. Paul

In 1922, 1923 and 1924 many Los Angeles entrepreneurs tried their hands at manufacturing radios, however, larger and better-known Eastern and Mid-Western manufacturers were marketing their products in Los Angeles. The competition from these emerging "giants" such as Atwater Kent, Kennedy, Kodel, RCA, Crosley, and Freed Eisemann, among others, was overpowering. Many burgeoning Los Angeles wholesalers and distributors took on the radio lines of these "big" names since these manufacturers were a ready source of quality and quantity-made radio sets. Los Angeles manufacturing entrepreneurs quickly found out that developing outlets, promoting their product line, and setting advertising budgets were expensive. Without licensing arrangements with Hazeltine for neutrodyne, or RCA for superheterodynes or regenerative circuits, the path to manufacturing was even more difficult because it left only un-neutralized reflex and trf circuits to be used. The failure rate was high and rapid, and most companies survived only a few months. Only some of the most aggressive companies which could get the financing, make a competitive radio set, and establish some marketing skills were kept alive.

LARGER and OLDER COMPANIES

Gilfillan Brothers, Inc., had been in business since the mid teens as a smelter and refiner, and then as a maker of automotive parts. By July 1922 Gilfillan had converted their automotive bakelite molding capabilities into radio part products, which

included sockets, rheostats, knobs, variometers, adaptors, and condensers. In the spring of 1924 Gilfillan, using its own parts, was marketing a two tube reflex kit, the RA-1. In July 1924, Gilfillan acquired Radio Service Laboratories, Inc. (RSL) of Asbury Park, New Jersey, and in so doing acquired RSL's neutrodyne license to manufacture neutrodyne receivers under Hazeltine patents. The company announced the "first licensed neutrodyne sets manufactured on the (West) Coast." The Gilfillan Neutrodynes GN-1 and GN-2 were introduced at \$175 and \$140, respectively, in August 1924. Neutrodyne kits (NA-2 and NA-3) were also made but targeted primarily for overseas marketing.



Rear View of Assembly—2-Tube with Crystal

RA-1 Kit, 2 tube reflex, Gilfillan Bros., Inc.

Advance Electric Company had been making power supply equipment in 1921, and battery chargers, ac rectifiers, and condensers in 1922 and 1923. Advance brought to market a "fixed" crystal detector part in early 1924, and the owner, Fritz Falck, decided to enter the radio market by the summer of 1924. Un-neutralized two and three tube battery sets which used '99 tubes were marketed. The three tube set, a Model 4, used a reflex circuit with the first tube performing

rf and af duties, the second tube was the detector, and the third tube was a second audio stage.

Patterson Electric (later becoming Patterson Radio Co.) may have been in business as early as 1919 but was known to be making crystal sets by 1922. In late 1923 Emmett Patterson marketed reflex sets, and in 1924 took on a wholesaler-distributorship for the WorkRite line of radios. **Patterson** later gave up the line to become a full time manufacturer of his own radio sets.

Wireless Shop was making variable condensers in 1920. The company broadened its line of parts, and an advertisement in the October 1922 issue of *Radio Journal* magazine contained information that Wireless Shop had been shipping parts to Asia, New Zealand, and Hawaii. Wireless Shop's owner, A. J. Edgecomb, wrote three articles for *Radio Journal* magazine in November and December 1922, and February 1923. The articles had pictures, schematic diagrams, and described a two stage rf amplifier, a detector and two stage af amplifier, and a multi-circuit tuner. This Wireless Shop radio receiver, type 125, was sold as a kit for \$106, or factory wired for \$125. About the same time a three tube trf kit with loop antenna was added to the line. Wireless Shop may have sold these as assembled kits. In February 1924 one and two tube knockdown kits were being advertised. The radio set manufacturing venture, including kits, proved uneconomical and the company soon fell back into doing what it did best, making parts primarily for the Los Angeles radio manufacturing industry.

Gilfillan, Advance Electric, and Patterson weathered these early days, survived through the 1920's and went into the 1930's as viable radio

manufacturing businesses. Wireless Shop survived into the 1930's as a parts manufacturer.

REFLEX SETS

In the early 1920's the home assembly of reflex radio receiving sets became very popular because a kit could be purchased rather cheaply. Many radio service shops and garage operators got into the assembly process by buying kits or parts (\$20 to \$40 expense), assembling a set, adding \$20 to \$30 to the cost and selling a reflex set for \$40 to \$70.

Karl Hatfield¹ worked at his father's radio service shop, "Hatfield's Radio" which very early became "Karl Hatfield and Son" at 4622 Hollywood Blvd., Hollywood, California, starting in 1924. He remembers helping his father assemble many dozen Harkness reflex sets in those early years. Hatfields never advertised they made radio sets, as Karl remembers.

In 1923 and 1924 over twenty radio manufacturers and assemblers were advertising in *Radio Journal* and *Radio Doings* magazines² and most of them were contending for the low price reflex set market in Los Angeles. The assemblers, a populous group, were typically radio repair shops, but included a few retail radio parts distributors and undoubtedly a few garage shop operators. Their products were typically a two or three tube reflex circuit, made in small quantity, and seldom had a name or model number on the set. Their product was supplemental to their regular radio repair business or retail radio parts sales. It is believed many local repair shops joined the reflex-making brigade and their collective number of reflex sets made was likely to have been in the hundreds of sets per month.

Only a handful of set makers

LISTING

A list of set manufacturers and assemblers in Los Angeles in 1922 through 1924 is shown. An earliest advertising date from *Radio Journal* or *Radio Doings* magazines is included. The summary attempts to (1) identify many manufacturers and assemblers, (2) provide a flavor of the manufacturing activities in Los Angeles in that era, and (3) give some chronological order of when manufacturers and assemblers began business.

C & R Radio Shop	Rogwell Rcvr "The Eagle"	Jul. 1922
Radioette Mfg. Co.	Pocket radio cyrstal set	Jul. 1922
Western Radio Research	CR 1004	Oct. 1922
Labs. of America	CR 99 — four tubes	Dec. 1922
Wireless Shop	Type 125, five tube	Feb. 1923
	Perflex (kit only?)	Apr. 1923
	Perflex 3111	Aug. 1923
	Perflex 2 console	Nov. 1924
Eclipse ³	Equatone	Dec. 1923
	Console, three-six tubes	Feb. 1924
	Melotone	Apr. 1924
	Wurlitzer	—
Patterson Electric	Jewel, four tube, also two and three tube sets	Dec. 1923
Hayden's Electric	Greyhound, G-2 Jr., two tubes \$75 to \$550	Jan. 1924
Radio Lab. & Mfg. Co.	Three and five tube sets	Feb. 1924
Radio Products Co.	Supervox, portable, four tubes	Feb. 1924
Angeles Radio Mfg. Co.	Angeles Reflex, seven models, \$75 and up	Apr. 1924
Californian Radio Co.	The Californian, C-1, two tube super-reflex. Also C-2 and C-3 (three tubes)	Jun. 1924
Ultra-Flex Mfg. Co.	Portable	Jun. 1924
Palmer Radio Mfg. Co.	Two tube reflex, \$68.50	Jun. 1924
C. D. Tanner	Neutroflex III, three tube, Tannerflex, crystal sets	Jun. 1924
R. F. Bowers	Two tube reflex, \$85	Jun. 1924
Los Angeles Sales Co.	Two tube reflex	Jul. 1924
Joe Grissom	The Hollywood, with Timmons horn built in, \$85	Jul. 1924
Gilfillan Bros.	GN-1, GN-2	Aug. 1924
Advance Electric	Model 4, three tubes	Sep. 1924
Guarantee Radio Co.	Two tube reflex	Sep. 1924
Summers Radio Co.	Suraco, two tube reflex	Oct. 1924
X-L Radio Co.	Crystal set	Oct. 1924
K. N. Ford	Crystal set	Nov. 1924
Walker's Radio Shop	Two tube super-reflex, \$75	Nov. 1924
Echophone ⁴	V-3, F-5	Dec. 1924

would be considered legitimate radio set manufacturers. Such a manufacturer was usually in one business only and that was the making of radio sets. He made trf or reflex sets (unneutralized) and he usually put a model or type designation on the set.

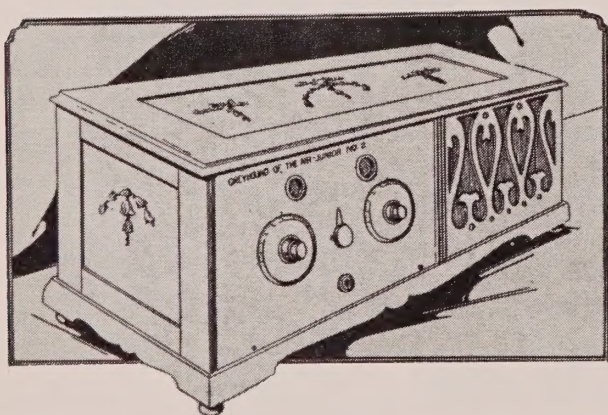
REFERENCES

1. Karl Hatfield, retired, living in Glendale, Calif.

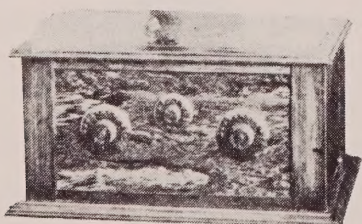
2. Background for this article included a review of thirty issues (July 1922 to December 1924) of *Radio Journal* (monthly) and 103 issues (July 1922 to December 1924) of *Radio Doings* (weekly) magazines.

3. SCARS club member Stewart Oliver reports he now owns a set engraved with Wurlitzer on the front panel and Eclipse on the inside chassis panel. He believes Eclipse obtained a contract from Wurlitzer to make these sets for West Coast distribution and sale.

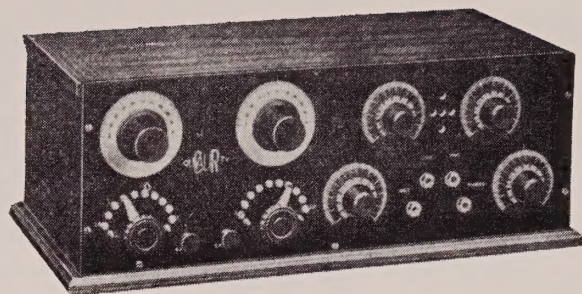
4. An Echophone ad in December 1924 showed Long Beach, Buffalo, and Sunnyvale as manufacturing addresses for V-3 and F-5 sets. Armac was noted as selling and distribution agent. (Ed. note: The Radio Shop company, using the Echophone trade name, started making radio sets in Sunnyvale, Calif., in 1922. Los Angeles radio production of Echophone sets started in Long Beach, a city near Los Angeles, in December of 1924.) Stewart Oliver, SCARS member, says he has seen a half dozen V-3 sets but has never seen a Long Beach label on any.



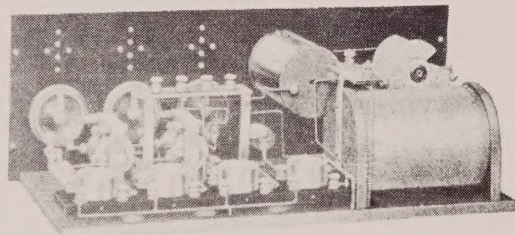
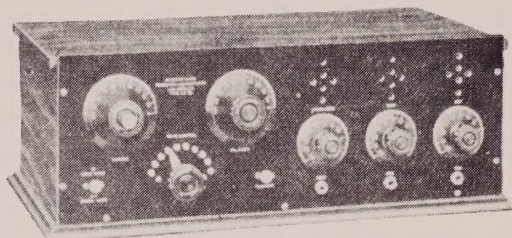
Greyhound of the Air, Hayden's Electric



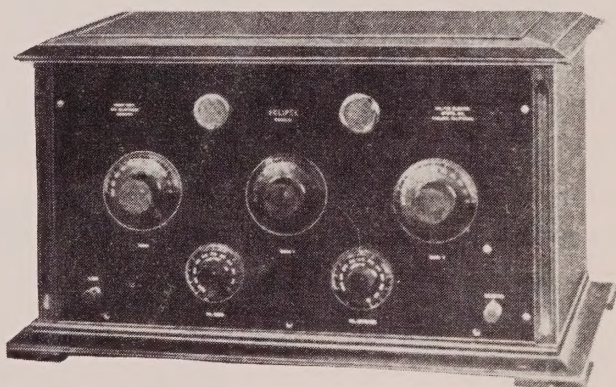
Los Angeles Sales Co., 2 tube reflex



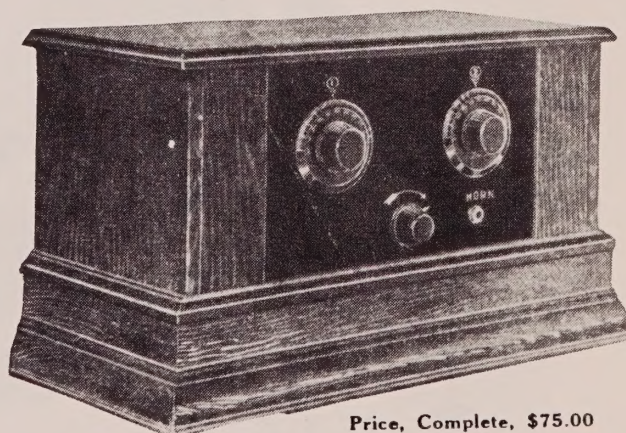
CR1004, Western Radio Research Labs.



Westlab CR99 (4-01A's), Western Radio Research Labs.



Equatone, Eclipse Mfgs., Inc.



Price, Complete, \$75.00

Walker's Radio Shop, 2 tube super reflex

1924 KODEL P-12

Featuring the Ultra-audion detector

By Walter Curry

The Kodel P-12 is a lightweight two tube portable which sold in 1924 for \$22.50. Since the P-12 was advertised to weigh only eight pounds including headphones and batteries, it was a true take-along portable and would have been a hit at picnics on a summer evening. As can be seen in Figures 1 and 2 the earphones will store inside the front cover with plenty of room for batteries inside the rear cover. The

case is covered with black pebbled leatherette and looks similar to a Kodak camera of contemporary vintage, perhaps to infer that a Kodak and a Kodel were logical traveling companions.

The rear view in Figure 2 shows the compact chassis. The single tapped honeycomb tuning coil is mounted with the detector tube in the center of it. The tuning capacitor is a small mica compression unit



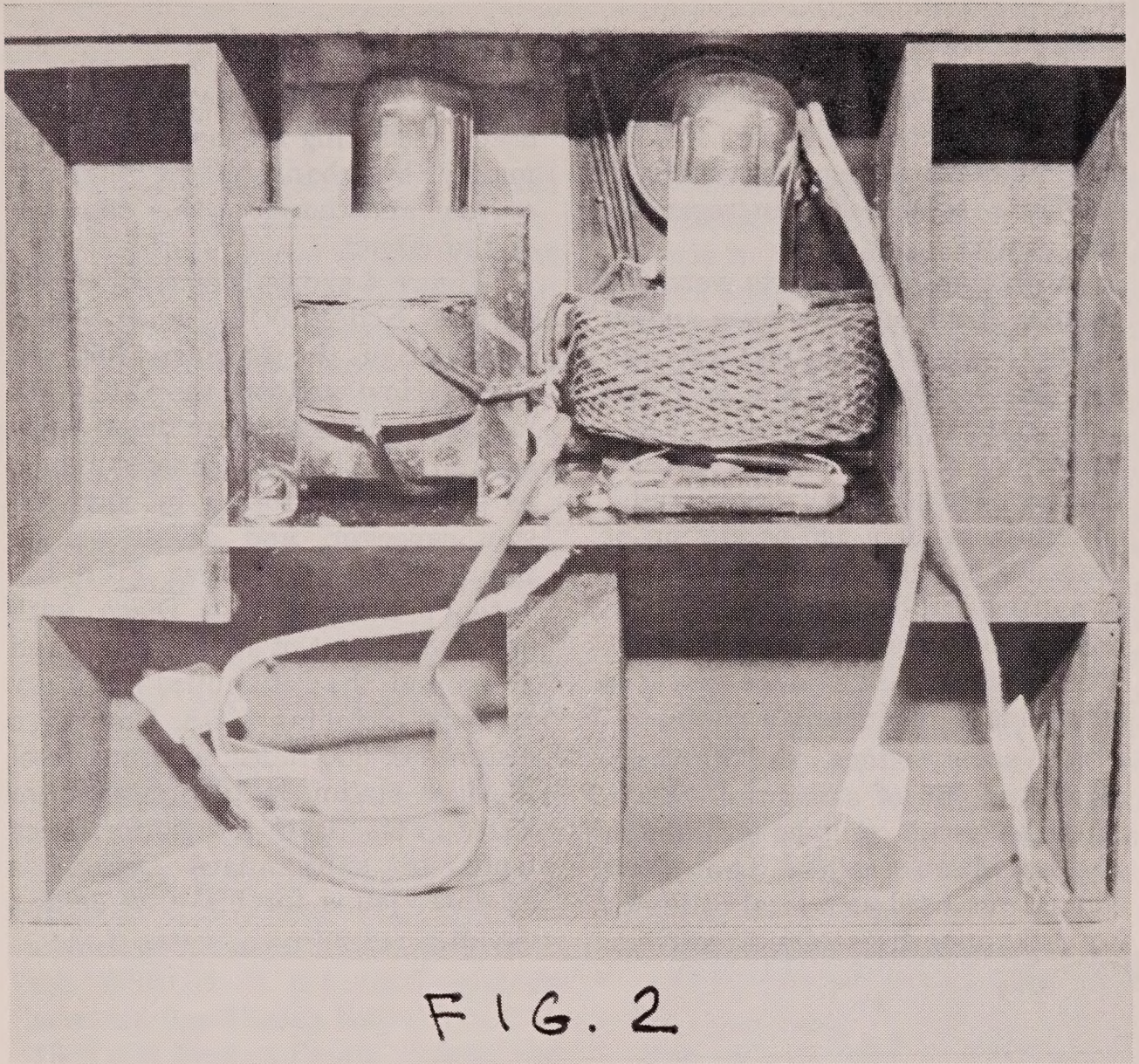


FIG. 2

with the antenna coupling capacitor built in. The P-12 circuit consists of a DeForest “ultra-audion” detector followed by a single stage of audio amplification using UV199 tubes. Figure 3 shows an early form of ultra-audion regenerative detection submitted by DeForest and printed in the February 20, 1915 issue of *Electrical World and Engineer*. Dr. DeForest claimed in a letter to the IRE in 1915 that his detector was much simpler than Armstrong’s complicated circuits and worked almost as efficiently and far more simply. A single tapped coil is required and the circuit is usually employed only for reception of the broadcast band and longer wave-

lengths. Tuning is accomplished by changing both the inductance and capacitance of the tuning circuit. The ultra-audion circuit is somewhat critical as to filament current, which must be just right for good results. It

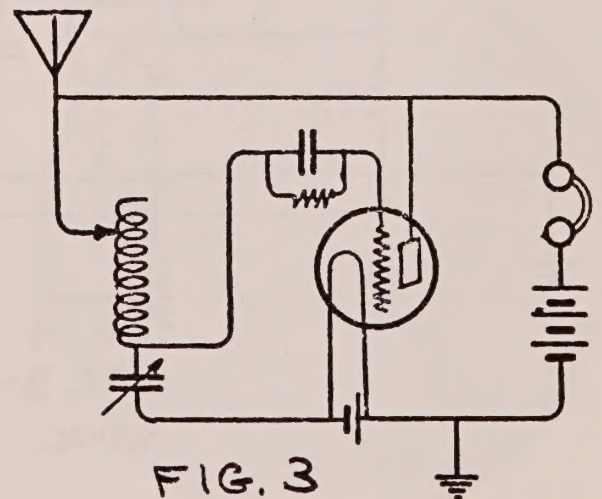


FIG. 3

should be noted that there is no provision for separate regeneration or feedback control factor. Instead only filament voltage is varied to provide a combined gain/regeneration control.

As late as 1916 experts were still arguing about how the ultra-audion circuit worked. Dr. DeForest still insisted in a letter to the IRE that "the ultra-audion circuit is not and cannot be a 'regenerative circuit.' There is only one oscillating circuit." Others called it a self-oscillating or beat-tone detector. Armstrong stated in a 1916 IRE discussion that when the circuit is analyzed and redrawn, it becomes evident at once that it is an ordinary regenerative circuit.

To some extent, the disagreement was one of semantics, but in truth the circuit could be operated in all the above modes. The ultra-audion was used as a local oscillator for early superheterodyne receivers.

It was also used as a marginally oscillating beat-tone detector and as a non-oscillating regenerative circuit mainly by changing the filament current and therefore the loop gain of the circuit.

Figure 4 shows the actual circuit of the Kodel P-12, which is a variation of the original DeForest circuit. How well will the P-12 work in the field? Set operation is fairly smooth and simple. Coarse tuning is by coil tap, fine tuning by compression capacitor, and gain/regeneration by filament rheostat. From the author's home in San Diego, with only twelve feet of antenna wire and no ground, the P-12 pulled in twenty stations including KOA Denver, a distance of 850 miles. A strong local Mexican station is 10kc away from KOA. This level of performance tends to substantiate DeForest's original claims for his ultra-audion circuit.

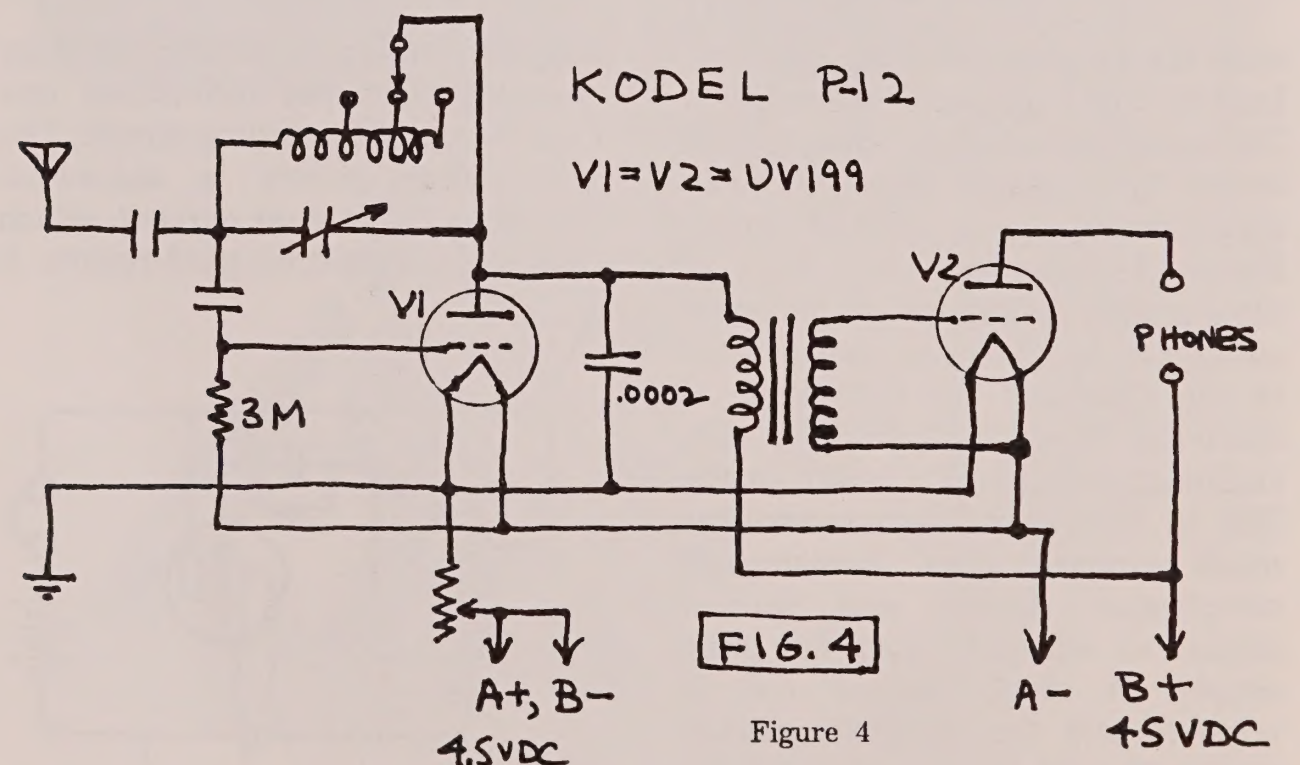


Figure 4

RUSSELL M. PLANCK

R.M.E. PIONEER

By Arlo Myers

Recently I acquired and restored to operation an RME-69 communication receiver, serial #529. This set was obtained from its original owner, Burton Jones, WB6JBH, formerly 5BAK of Austin, Texas. Burt had ordered the set from the factory in December 1935. Along with the receiver and the original owner's manual was a letter Burt had received from the RME factory in response to his own letter describing and discussing measurements he had made of his new set's I.F. selectivity and audio response. The reply from RME, dated February 27, 1936, was signed by R. M. Planck.

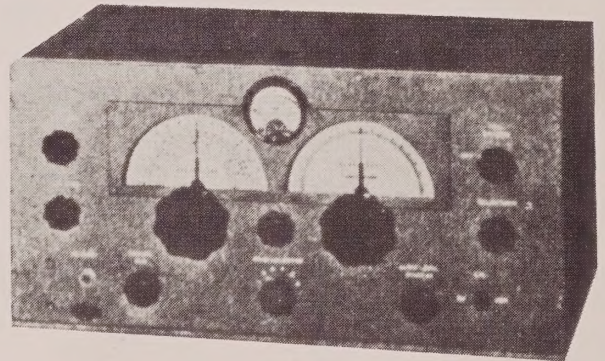
Suspecting that R. M. Planck might have been a ham, I looked up the name in my 1983 name-indexed callbook and found a Russell M. Planck with the call W9RGH. Checking W9RGH in my 1936 callbook revealed that Planck held that call in 1936 and lived in Peoria, Illinois, the original home of RME. A look at the 1988 callbook showed that he was still listed, with an Illinois address.

Confident that I had located the man who signed the letter from RME, I sent off a letter to him and enclosed a photocopy of the 1936 letter. A reply dated June 7, 1988, verified that he was, indeed, the Russell M. Planck who had authored the letter and was, in fact, one of the two men who established the Radio Manufacturing Engineers, Inc., in Peoria in 1933.

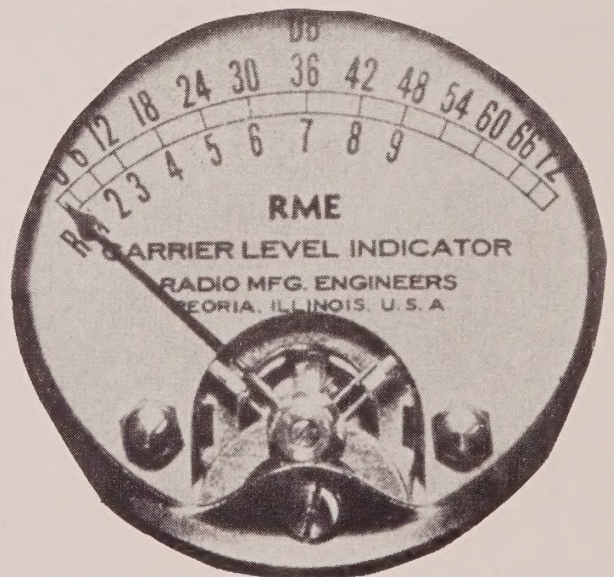
After earning a college degree in physics, Russ Planck moved from Peoria to Jackson, Michigan, where in the early 1930's he worked for the Sparks-Withington Co., manufacturers of the Sparton radio.

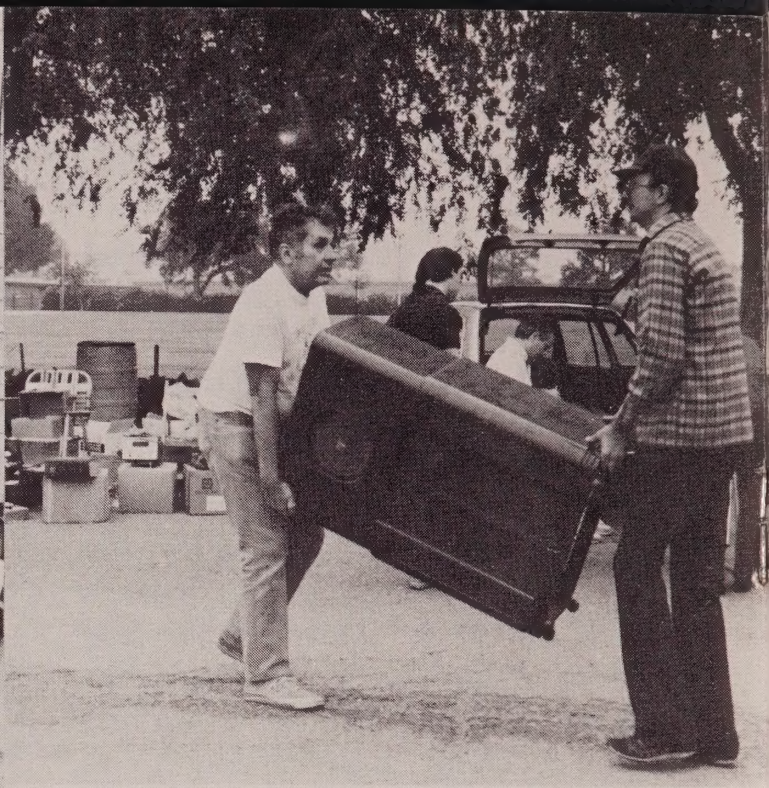
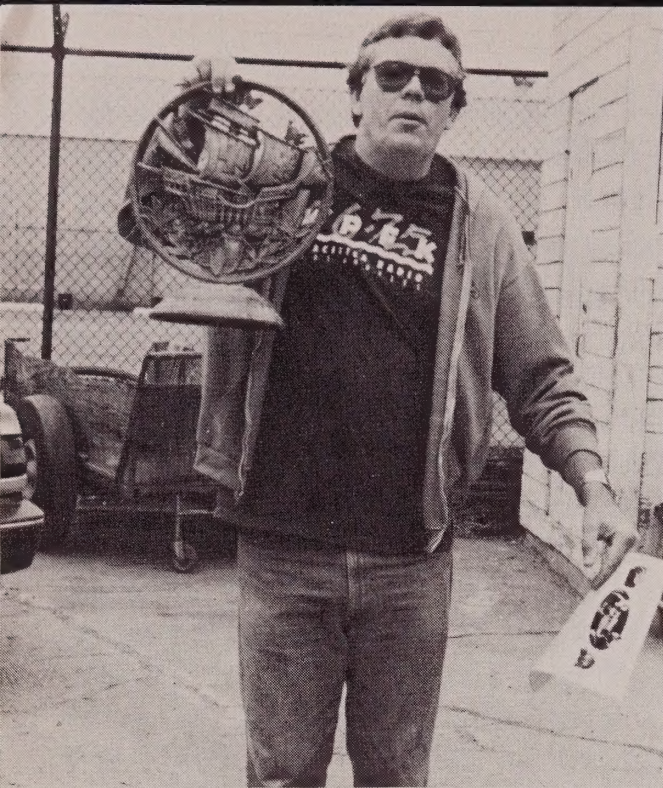
(Remember those grand old Sparton broadcast receivers?) He returned to Peoria in 1933 to be a co-founder of RME, and remained with RME and its successors until his retirement. RME was sold to Electro-Voice in 1955, and its amateur radio line was discontinued in 1962. Planck moved to Newport, Tennessee in 1964, when E-V opened a new plant there, and was vice president of Electro-Voice's Tennessee operation when he retired in 1968. By that time, E-V was a division of Gulton Industries.

Russ was originally licensed as 9COD in 1921, held the call W8EUR in Michigan, and in 1933 was issued W9RGH, which he has held ever since. At age 82, he is retired in Washington, Illinois, and still is an active ham operator.

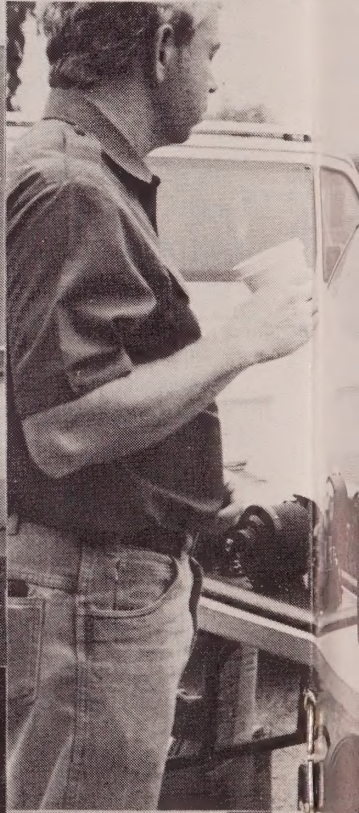
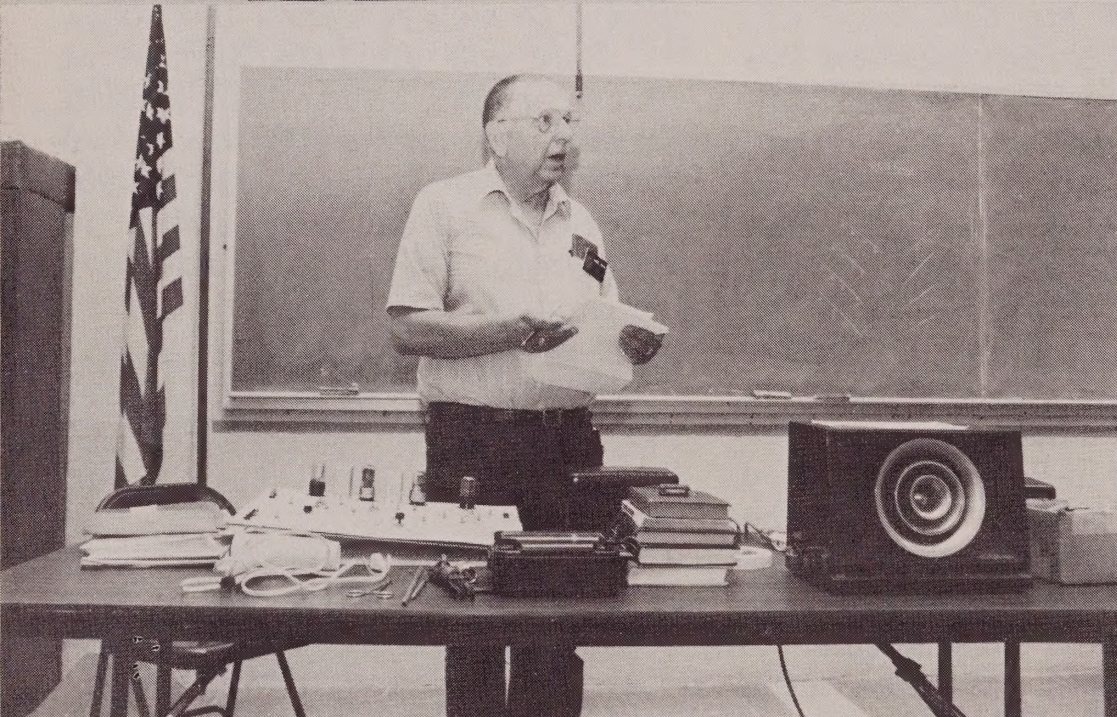


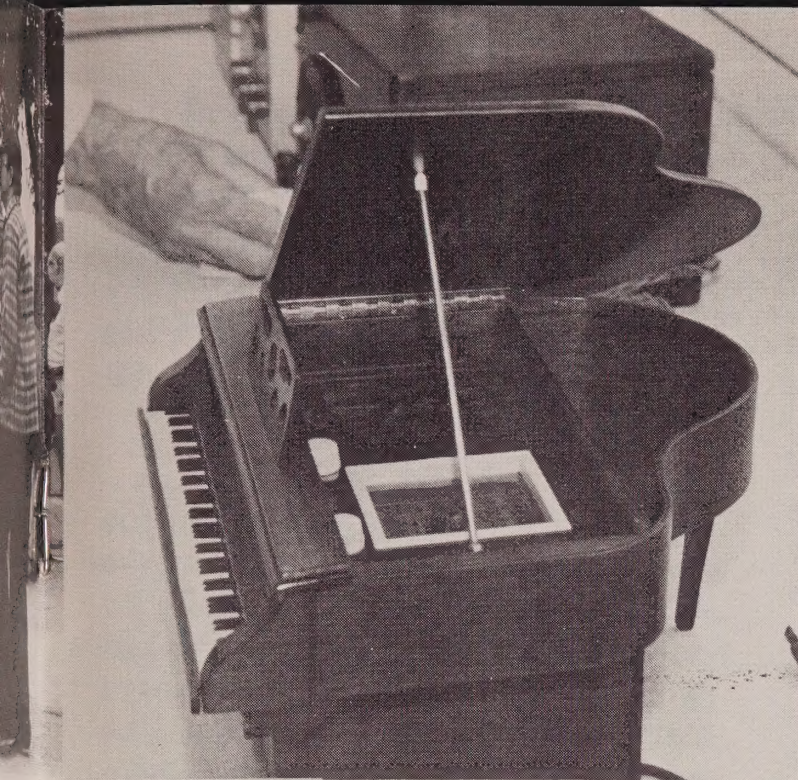
RME-69 communications receiver



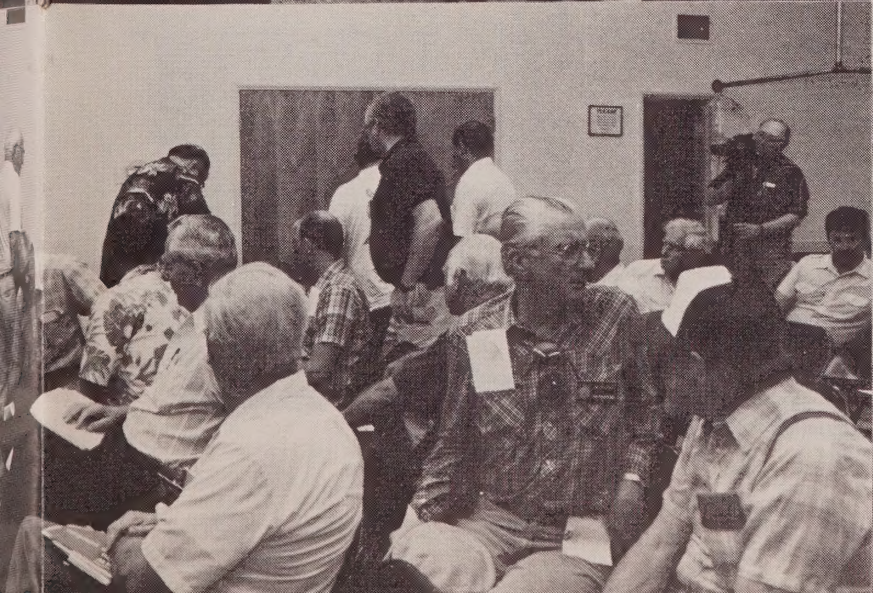
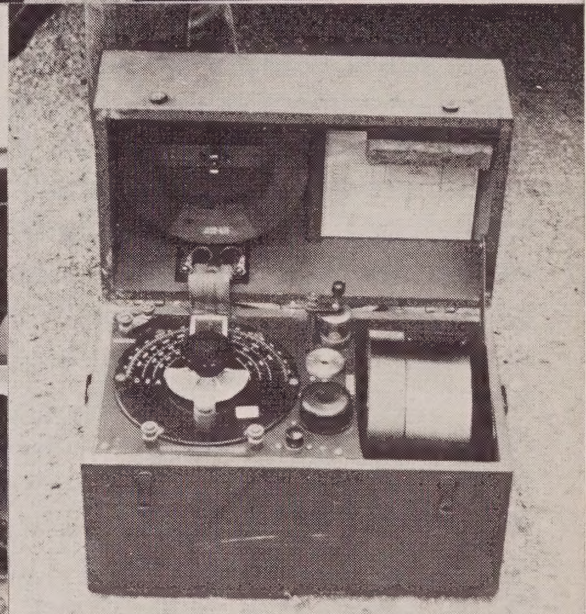
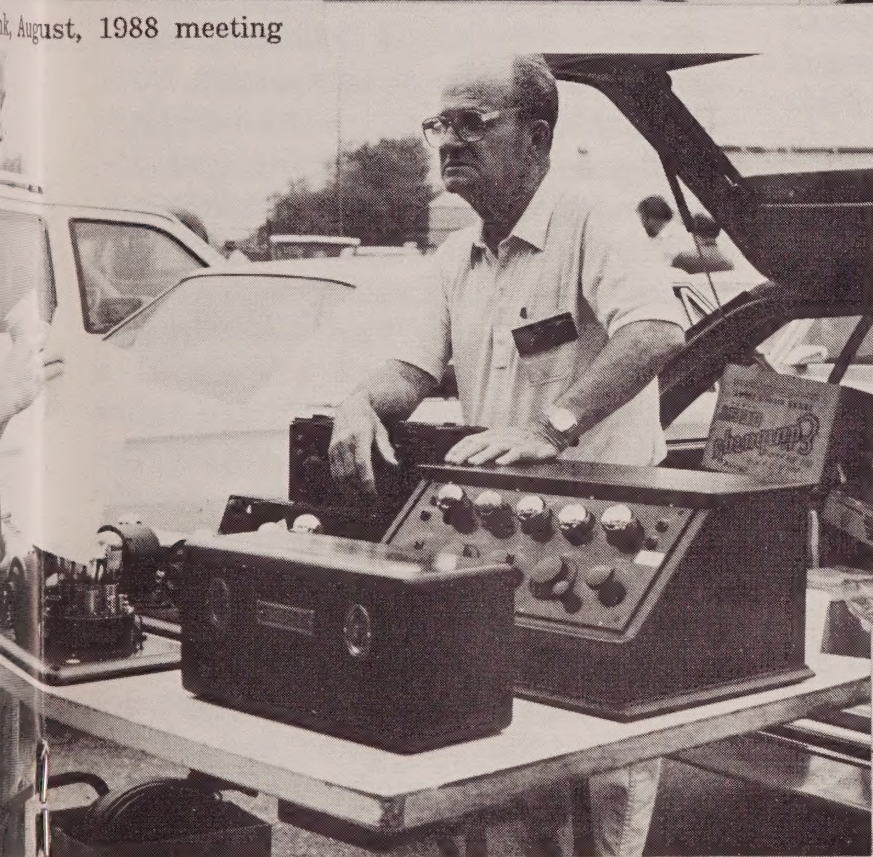


Burbank, August 1988 m





ok, August, 1988 meeting



SHELDON RADIO COMPANY

By F. A. Paul

Synopsis

Mr. C. C. Sheldon established the Sheldon Radio Company in La Verne, California in 1923, however there is some indication he might have been involved in radio work since 1919. Mr. Sheldon was listed in several IRE membership yearbooks of the late 1920's and into the early 1930's. By 1937 he was no longer listed as an IRE member. His products over the years were custom radio receiving sets and he designed, developed and sold his own sets directly to the public. He built several large and expensive sets and probably had a small following of loyal customers who could afford his custom built sets. His last year in business was likely 1934 when he was still listed in the Los Angeles City Directory.

Plant Locations

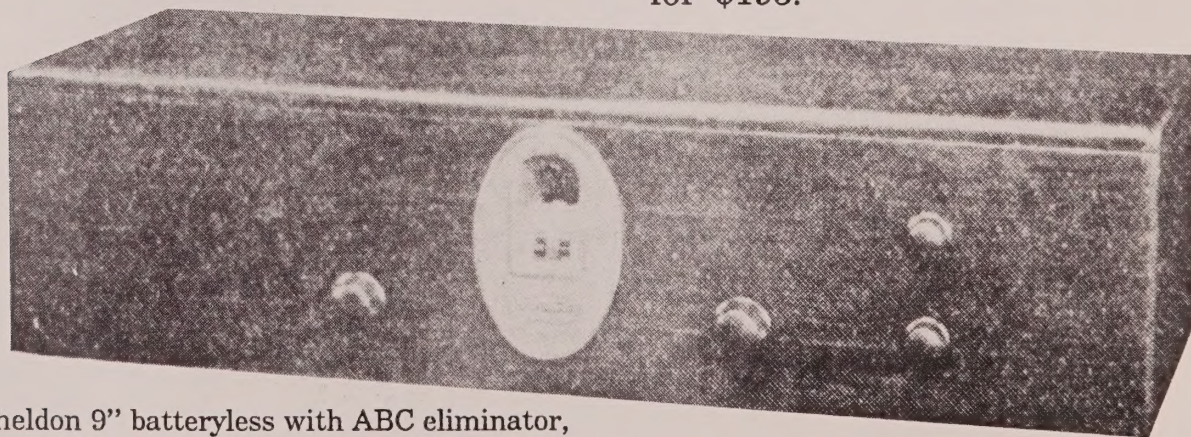
Sheldon Radio Co. was located in La Verne until about August 1925 when the plant moved to 10th and Wall Sts. in downtown Los Angeles. This move was undoubtedly made to get into the middle of the radio "action" in Los Angeles. The company later moved to 1519 Georgia St., Los Angeles, and by September 1928 moved to 1558 Vine St. in Hollywood, Calif. The company had a showroom

at 605 S. Fairfax Ave., near Wilshire, by 1930. In June 1931 the company moved to 2631 W. Avenue 32 in Los Angeles, the firm's last known address.

Radio Sets

A full page advertisement in the June 20, 1925 *Radio Doings*, by the Sheldon Radio Co. (La Verne, Calif.) showed a picture of a set which had won a \$1,000 gold contest in Chicago held by *Radio Digest* magazine. The advertisement had text quoting *Radio Digest* magazine as follows: "Interchangeable coils of new design from twenty meters up..... extreme selectivity..... fine workmanship and appearance" among other accolades. A finished set was offered at \$145 and a knockdown set for \$80.

By September 1927 Sheldon Radio Company had introduced a battery-less receiver with ten tubes and six tuned stages. Again the frequency spectrum was twenty meters and up. Apparently the Sheldon company was reaching for short wave buyers in a custom market. This "Sheldon 9" with ABC eliminator used a new QRS 400 ma rectifier tube (tenth tube) and sold for \$285. A battery model was available for \$195.



"Sheldon 9" batteryless with ABC eliminator, \$285. "First receiver to use QRS 400ma rectifier tube."

In September 1928 a new model 210 "exquisite all-electric ten tube marvel" was advertised with built-in speaker, but less tubes for \$227. Again, Sheldon utilized six tuned stages and the set was advertised with a total dial travel of thirty-three inches, five kc selectivity, push-pull detector, standard Kellogg ac tubes, shielded circuits, and interchangeable coils for short waves. The advertisement in September 1928 *Radio Doings* noted "eight years experience.... and highly rated by Dun and Bradstreet." A November 1928 advertisement had "models ranging in price from \$275 to \$2500. (Ed. Note: A new Ford cost about \$300 in 1928.)

A company-supplied bit of information in a May 3, 1930 *Radio Doings* was: "W. J. Van Dyke, M-G-M director, has just received his third Sheldon chassis for his Spanish cabinet.... Sheldon has been building sets for eleven years."

A full page ad in the June 1931 issue of *Radio* magazine shows an automotive radio at \$69, with 236, 237, and 238 tubes and the set included a dynamic speaker, B battery box, and remote control. Litz coils offered high efficiency in the rf circuits. Current consumption was slightly over one ampere.

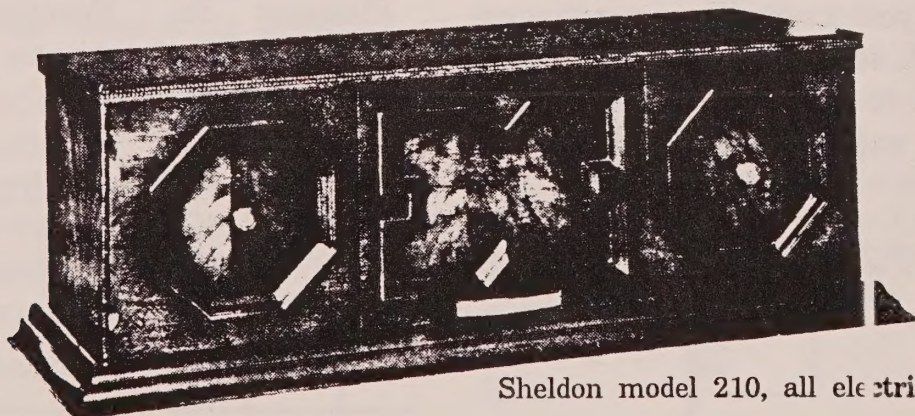
A May 1931 *Radio Retailing* magazine "Tube Kit Directory" shows a Sheldon set using 9 '27's, 2 '45s and an 80. (Ed. Note: That looks

like a belated tube listing of an earlier set.) A low boy tube complement in an October 1932 issue of *Radio Retailing* shows 5 51's, 2 56's, Wund., 2 45's and an 80 tubes. The same issue shows an auto model A-6 with 36 37, 38, 39, Wund., and a 41 tubes. In October 1933, *Radio Retailing* listed a Sheldon auto set SA-7 using 2 6D6's, 6F7, 85, 2 41's and an 84. After 1933 no information was seen on the Sheldon Radio Company.

Summary

Mr. C. C. Sheldon spent more than ten years in the radio manufacturing business in the Los Angeles area. He specialized in multi-tube custom sets, developed a following of loyal customers, and stayed abreast of the developing radio technology. Only one Sheldon set has been seen at local swap meets and that would support the Sheldon Radio Company as a low volume producer. It appears that his final few business years were devoted primarily to automobile set manufacturing. Mr. Sheldon was an innovator in design work, which showed up by his use of a QRS 400 ma rectifier, push-pull detector, Wunderlich tubes, and six stages of rf amplification.

Ed Sheldon (SCARS member) has acquired a C. C. Sheldon 9 or 10 tube radio which has been totally rewired (and probably incorrectly). He plans restoration of that set.



Sheldon model 210, all electric, 10 tube

Restoration Tips



— Edited by Joseph C. Smolski

Q: I bought a battery set that uses 90 volt and 1.5 volt batteries. It has a converter in it but the A supply is no good and the B supply puts out 135 volts. What I need is a schematic for a 90 volt and 1.5 volt eliminator.

*Paul Gruber
Santa Fe Springs, CA*

A: I suggest that you consider reworking your existing battery eliminator. From your question it sounds like the 135 volt supply is still good. Check it out and replace any defective capacitors or other bad parts. If it is serviceable, you can probably power your 90 volt set with the addition of just two parts: a series dropping resistor and a shunt filter capacitor. See figure 1.

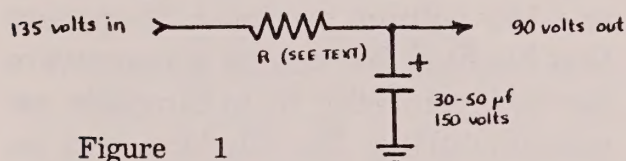


Figure 1

Connect the capacitor as close to the receiver as you can, between the 90 volt input terminal and the common input terminal, if possible. The resistor can be mounted anywhere that is convenient, even inside the battery eliminator, if you wish.

The value of the resistor may be determined experimentally or it may be calculated using Ohm's Law, provided you know how much current the set draws when it is connected to a 90 volt supply. If you chose the experimental route, try an

initial value of 1,000 ohms, 5 watts. Measure the B voltage at the 90 volt input and then change the value of the series resistor for a higher or lower value, as required.

See figure 2 for the low voltage supply circuit. It is very important to mount the IC regulator on an adequate heat sink. A flat piece of sheet metal will do, or you may be able to use the chassis of your present battery eliminator. If you use a separate piece of sheet metal, mount it vertically for good air circulation. A total radiating area of approximately 30 square inches should be sufficient.

Assuming that the power transformer in your existing battery eliminator is still good, you may be able to use its low voltage secondary winding to power this circuit. If it delivers between 4 and 12 volts RMS, it should be OK. Otherwise you may use a separate 6.3 volt filament transformer rated at 1.5 amperes or more. Suitable transformers and any other parts you may need are available from Antique Electronic Supply in Tempe, Arizona.

Ed. Note: *Restoration Tips* editor, Joe Smolski has moved to 835A Pleasant St., Framingham, MA 01701. His telephone number is (508) 879-2778.

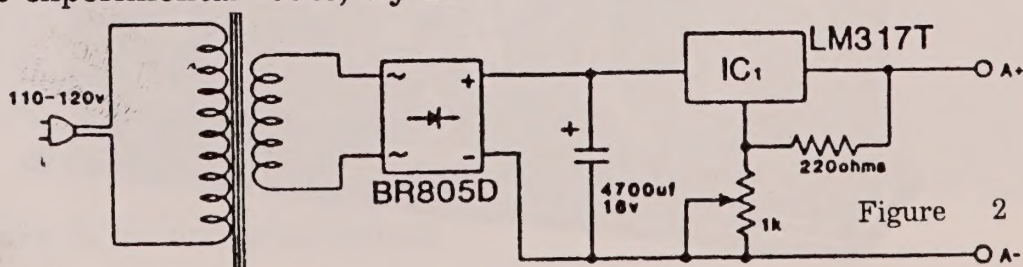


Figure 2

One Shot Museum Exhibits

Your SCARS museum committee has studied the possibilities of setting up a historical radio-TV museum. Most of these museums have either never gotten off the ground, or have failed after some period of heroic efforts to keep them going. There are a number of private museums but they are not in public places and do not invite the general public. The two major problems are finding housing in a suitable public area, and manning the exhibits. We may strike it lucky some day but we could keep searching forever for the right spot.

Meanwhile, we could set up one-day exhibits at shopping malls and at other public places. This activity is an exciting project, and could be done several times a year. The Sacramento club has been doing this for some years with very gratifying results. It's a fun project. There is great public interest. New members pop up. Leads on long-stored old sets abound. Some shopping malls will pay up to \$500 for a weekend exhibit.

Our first job is to find likely spots and occasions for exhibits. You, our members, may know of shopping malls, public buildings or conventions that would be good spots for an exhibit. If you know of likely exhibit spots, please contact Floyd Paul or Morgan McMahon. We will follow up on your leads. With a little luck we can find opportunities for some really fascinating and rewarding projects!

ANNOUNCEMENTS

The Northwest Vintage Radio Society of Portland, Oregon, will have a November 12 swap meet. Call Dan Howard, president, (503) 761-7799 for further information.

The Puget Sound Antique Radio Association has a November 20 meet in Seattle, Washington, and December 11 swap meet. Call Max Kaplan at (206) 851-4187 for further information.

VINTAGE RADIO SOLD

Vintage Radio Publishing sold to Antique Electronic Supply.

Morgan McMahon, radio historian and author, recently sold his Vintage Radio book publishing business to Antique Electronic Supply of Tempe, Arizona. McMahon became the first person to write and publish books for the antique radio hobby when he introduced *Vintage Radio 1887-1929* in 1970. Other books which followed were *Radio Collector's Guide 1921-1932*, *A Flick of the Switch 1930-1950*, *Most often Needed 1926-1938 Radio Diagrams*, and *H. Gernback's 1927 Radio Encyclopedia*.

Morgan McMahon is a radio amateur whose career has been in solid-state technology. He holds the distinction of having taught the first transistor course given in the West, at UCLA, and was Chief Scientist for the largest U.S. manufacturer of electronic parts. When he became interested in the history of electronics he found that the early days of radio were not well recorded, and launched Vintage Radio.

Morgan said he was very pleased to have Antique Electronic Supply taking over the business. A.E.S. has supplied parts and literature for radio restoration since 1982, and will continue to make all of the above books available through their business in Tempe. Interested individuals may write to them at 688 W. First St., Tempe, AZ 85281, or call (602) 894-9503.

MINUTES

SCARS Meeting

August 20, 1988

Lockheed ERC, Burbank

The meeting was called to order at 10:45 A.M. by Mike Adams, president, who greeted the members, spouses, and their guests.

Due to the absence of Mary Curry, the treasurer's report was given by Ed Sheldon, who stated that the club is solvent and that the club is growing, with a current membership of well over 600.

There was a discussion in which it was stated that although the cost of printing and mailing the *Gazette* is running around \$8.00 permember, we expect to hold the membership dues at the present level of \$10.00 per year.

Ed Sheldon, secretary, asked for approval of the minutes of the last meeting as published in the August 1988 issue of the *Gazette*. Approval was so moved and passed.

A list of thirty applicants for membership in SCARS was presented. These applicants were voted into membership.

Mike Adams announced that the program for the next meeting will be furnished by SPERDVAC. It will consist of a fifteen minute comedy and a fifteen minute adventure skit. He also announced that the meetings planned for next year will consist of two meetings in Burbank and two in Torrance.

Roy Tucker announced there will be a S.W. Hams convention at Disneyland in Anaheim on September 2, 3 and 4. There will be a SPERDVAC meeting on November 11 and 12 at the Viscount Hotel. Please contact Bobb Lynes or Barbara Watkins for more information.

A Splitdorf battery set, donated to the club by George Wood, was auctioned off by Mike Adams. The set brought \$40 for the SCARS treasury.

The business meeting was then adjourned at 11:20 and was followed by a presentation on the "Repair and Restoration of the All American Fiver." This was followed by a presentation of the contest results, which is published elsewhere in this issue.

Ed Sheldon, Secretary

AUGUST CONTEST

Unlike the previous judging problem of competing for time against the auction, it was the quantity and quality of the August exhibits that prevented completion of the point compilation in time for announcement of ribbon winners during the meeting. The exhibitors did get a chance, though, to explain their endeavors to the "oos and ahs" of the crowd which clearly felt the exhibits were some of the most outstanding ever shown at a SCARS meeting. A total of thirty-one entries were made. Every named category had sufficient entries to stand by themselves, and the test equipment and meter class had to be broken into four groups for purposes of judging. Probably the excellent articles and lecture/demonstrations created by SCARS members recently account for the upsurge in interest in this category. Both simple meters and complex test gear won blue ribbons.

Auxillary radio apparatus such as converters and other "add ons" are collectable as shown by the entries in Category IV. The winner, however, was an operating instruction unit to teach Morse code. Transmitting tubes brought a number of entries from the 1920's and 1930's. The most unusual category, undoubtedly, was that of radio novelties. Keith Nennig not only won a blue ribbon for his piano-appearing radio, it got top points when all first prizes were compared, thus "best of show." This was a first time entry, too, for the exhibitor. Not only was the most unusual nature of the cabinet an attraction, but the fact that the set had been procured in almost junk condition and totally rebuilt established great appeal to the judges and audience.

*Roy T Tucker
Kathryn K. Tucker
Contest Chairpersons*

Contest Results

Category I, Transmitting tubes

- 1st. Larry Dean, 833 tube
- 2nd. Wat Panutai, VT-127A tube
- Hon. Men. Joe Knight, 212D tube
- Hon. Men. Pete Langlo, CWL 861 tube

Category II, Radio Novelties

- 1st. Keith Nennig, Piano radio
(also Best of Show)
- 2nd. Kenneth ERickson, Raggedy Ann radio
- Hon. Men. Pete Langlo, radio novelites
- Hon. Men. Wat Panutai, pictures

Category III, Receivers with 3 literature items

- 1st. Oral Boudreau, Crosley 706 Showbox
- 2nd. Wat Panutai, Pye
- Hon. Men. Celeste Jones, Air Castle
- Hon. Men. Oral Boudreau, Radiola III

Category IV, Auxillary radio apparatus

- 1st. Wat Panutai, Instructograph
- 2nd. Pete Langlo, Marine band converter
- Hon. Men. Roger Slattery, short wave converter

- Hon. Men. Pete Langlo, audio filter

Category V-A, Meters/Test instruments

- 1st. William Buckner, Westinghouse multimeter
- 2nd. William Buckner, General Radio wavemeter
- Non. Men. Les Rayner, Western Electric meter

Category V-B, Meters/Test instruments

- 1st. Joe Knight, student's voltmeter
- 2nd. Pete Langlo, Thomson ammeter
- Hon. Men. Roger Slattery, Weston voltmeter

Category V-C, Meters/Test instruments

- 1st. Tom Whipple, Hoyt tube tester
- 2nd. Keith Nennig, tube tester
- Hon. Men. Celeste Jones, Supreme tube tester

Category V-D, Meters/Test instruments

- 1st. Joe Knight, Wireless Shop portable test set
- 2nd. Wat Panutai, RCA test oscillator
- Hon. Men. Celeste Jones, Solar capacitor analyzer
- Hon. Men. Pete Langlo, Philco capacitor tester

Open Category

- 1st. Clarence Hill, Mission-Bell Model 833 receiver
- 2nd. Keith Nennig, Trav-ler portable receiver

Non-Judged Educational Category

- Roy & Kathryn Tucker, solid-state power supply for battery sets

ANTIQUE RADIO

at Amateur Radio Convention

Roy & Kathryn Tucker

For those who arrived early at the Southwestern Division ARRL Convention, held at the Disneyland Hotel on Labor Day weekend, an opportunity to view a number of antique radio demonstrations was made available. The program director of the convention asked a number

of antique radio fans, including a number of SCARS members, to put on a program Friday evening for all convention goers available at that time. Several hundred attended and observed five different presentations.

Gary Legal, N6TO, assisted by Bill Wysock, gave a live demonstration of a Tesla coil. This home made unit shot out six foot arcs! Another demonstration was of a rotary spark transmitter put on by Bert Ayers, W6CL, who was old enough to remember when these were "state of the art." Roy and Kathryn Tucker, N6TK and AA6TK, filled a number of tables with a representative selection of antique radio apparatus to show what has become collectable. This involved items from the pre-vacuum tube era to the 1950's and included both transmitting and receiving equipment. Most commented about was a virtually mint AK20 from the battery set era, a carbon microphone from approximately the same period, and a commercially made five meter amateur transceiver from the 1930's. Jan Perkins, N6AW, had a quite large collection of early equipment from the late Don Wallace, W6AM, including some of the equipment that won the Hoover Cup in 1923 for the nation's most outstanding amateur station. Morgan McMahon, N6VY, sat at a booth that displayed and sold several of his published works on radio history.

The overall presentation, lasting almost four hours, exposed a number of convention goers to antique radio and history for the first time. A number came up to these authors and stated they had never seen equipment that was used in the years before they were born, such as a cat's whisker or type 201A vacuum tube! Numerous application blanks for SCARS and AWA were passed out to the crowd.

Instruments and Measurements

Edited by Ed Sheldon



AUDIO OSCILLATORS/DISTORTION ANALYZERS

By Ed Sheldon

In Parts I and II I covered the development of the Audio Oscillator, including the Beat Frequency Oscillator and the RC Tuned Audio Oscillator. Because of the close relationship between the networks used for tuning the RC audio oscillator and those used for tuning the null in the distortion analyzer, it seemed appropriate to include them as Part III of these articles.

Part III

The Distortion Analyzer

In the period from 1913 to the 1920's there was a great deal of interest by both power companies and the telephone companies in the study of wave forms, harmonics, and noise. Electric generators used at that time put out a very poor waveform. The harmonics resulting from these poor waveforms tended to get into the telephone circuits by induction and by ground loops. This interference, the Telephone Influence Factor (TIF) as it was called, resulted in many studies of wave form and harmonic analysis by both parties. The fundamental frequencies used by power companies, of 25, 50 and 60 Hertz, were of course no problem to the telephone industry but the harmonics were detrimental to telephone service. This was, I believe, the first serious technical study of what we now refer to as "harmonic distortion" or "amplitude distortion."

Methods were developed using mathematical analysis and graphical

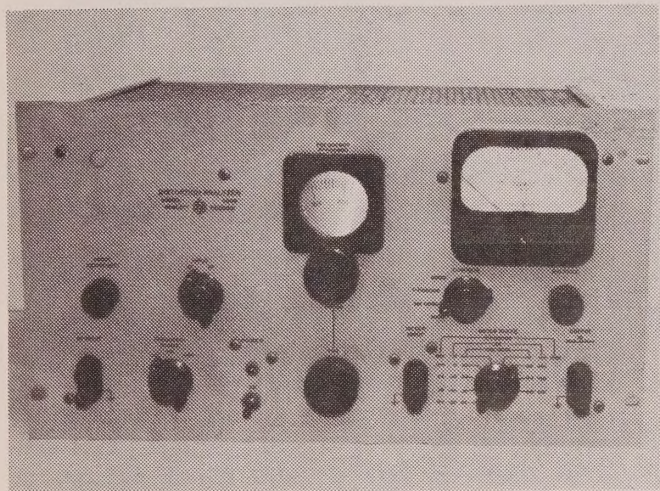
solutions to determine the waveform distortion, which resulted in many improvements being made in electric power generators.

When radio became popular in the 1920's, these techniques were applied to vacuum tubes and radio circuits. Other techniques were also adopted from the telephone industry, such as the use of wave filters and various resonant circuits to separate the harmonics so they could be measured and used to evaluate the performance of radio amplifiers.

In the late 1920's and the early 1930's the heterodyne method of wave analysis was applied as a method of analyzing a complex wave. This technique enabled rapid determination of the harmonics in a distorted waveform. The General Radio 736A Wave Analyzer is a good example of this type of instrument. However, faster, less expensive, and easier methods for measuring distortion were needed by the growing radio industry and the growing interest in "high fidelity."

As a result of the work of H. H. Scott of General Radio in 1937 and 1939 (and others) who showed that a sharp null could be obtained at audio frequencies using RC networks, it became possible to build a convenient, easy to use, instrument for making distortion measurements. This instrument, which most of us are familiar with, is the Distortion Analyzer.

The best known instruments were built by General Radio and Hewlett Packard. A popular and less expensive instrument was also marketed by Heathkit. Two examples of distortion analyzers that are pictured with this article are the Hewlett Packard 330-B and the Heathkit IM-12.



Hewlett Packard 330-B

The distortion analyzer is used by feeding a pure sine wave signal into the device being tested. The output is then connected to the distortion analyzer which has a RC network which can be adjusted to null out the fundamental signal. The residual signal (harmonics and noise) are measured on a wide band vacuum tube voltmeter. When properly calibrated, the instrument reads directly in percentage distortion. By using an oscilloscope with the analyzer it is possible to identify individual hum and harmonic components.

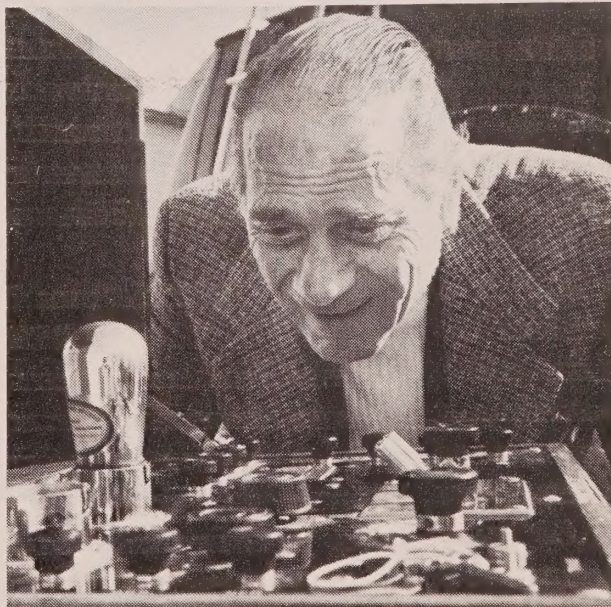
If you wish to read more on this subject I recommend two of Terman's books: (1) *Measurements in Radio Engineering*, Chapter VI and (2) *Radio Engineer's Handbook*, Section 13 on measurements.



Heathkit IM-12

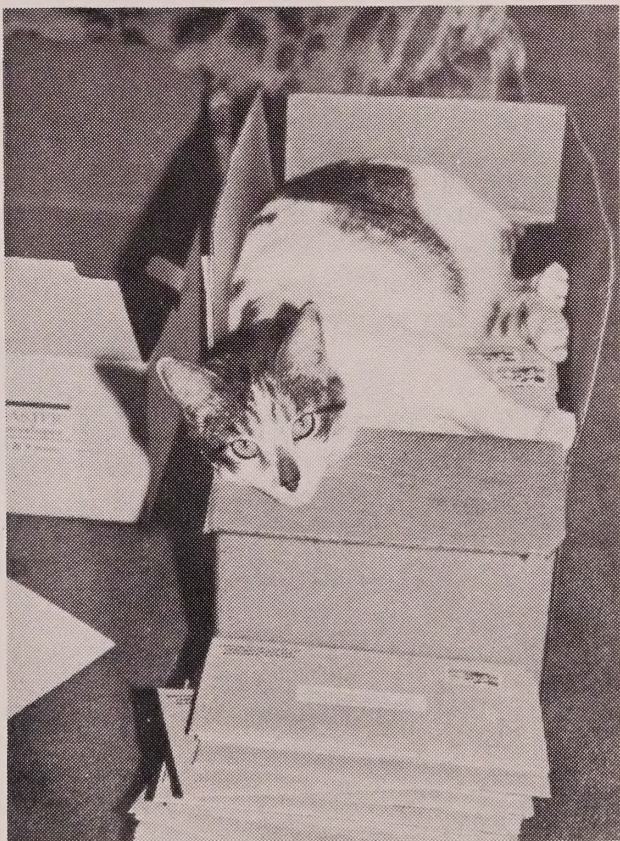
- UPCOMING CATEGORIES**
For SCARS Equipment Judging
November 1988 Meeting
- Category I:** Any form of two-way communicating equipment
 - Category II:** Any radio with the manufacturer's personal name on it (examples: Crosley or Grebe, but not Super Squawkertone)
 - Category III:** Crystal or one tube receivers of any type
 - Category IV:** Post-1945 tube broadcast receivers
 - Category V:** Tools used in radio construction or repair

There will always be an open category for any item of radio equipment that does not fit into any of the named categories, or where insufficient entries are made in a named category to justify three or more awards. Where more than five entries are made in a given group, there will be established two or more subcategories for judging. Entries of a non-judged nature for educational purposes are always welcome.





Working crew stuffing August *Gazettes*. L to R: Mary Curry, Floyd Paul, Bob Zelenack, Dorothy Paul and Nancy Zelenack. Walt Curry took the picture.



Cally Curry was too pooped to help.

SECRETARY'S MESSAGE

The 1988 update of the SCARS Roster is now available. If you wish a copy, please send a large SASE with twenty-five cents postage to Ed Sheldon, 656 Gravilla Place, La Jolla, CA 92037. If you wish one with a cover, send forty-five cents postage. We are also asking for a \$1.00 donation to the club to help pay for printing costs. Stamps are welcome.

ANNUAL DUES

The *Gazette* and your membership are on a calendar year basis. This November *Gazette* is the last issue for 1988. To receive the next issue, and to pay dues for 1989, please send \$10.00 (\$11.00 for member and spouse) in the enclosed envelope.



For Sale or Trade & Want Ads



ADS MUST BE SUBMITTED EACH TIME FOR EACH PUBLICATION AND ARE FOR PERSONAL USE ONLY. SCARS WILL NOT PRINT REPETITIOUS ADS. ALL ADS ARE SUBJECT TO EDITING. SCARS IS NOT RESPONSIBLE FOR ANY TRANSACTION OR THE CONDITION OF ITEMS ADVERTISED.

FOR SALE or Trade: Philco Radio Bar, Philco floor model (Bel Geddes design), and Zenith chairside, all in good condition. Will trade for Philco cathedrals, catlins, or novelty sets. Sindee Levin. 3040 Lake Glen Dr. Beverly Hills, CA 90210. (213) 205-8914

FOR SALE: Radiola V, \$350. WD12, brass tip, open in original box, \$10. Federal 417 (see P. 211 of Alan Douglas book, \$225. DeForest LS300 horn speaker (neck and bell original), \$125. November 1924 to October 1925 *Radio Broadcast* magazines, bound, 2 books, \$45. WD11, brass, open plus WD11 brass cracked base, good fil, \$50. F. A. Paul. 1545 Raymond. Glendale, CA 91201.

FOR SALE: SE 1420 C. Early Navy receiver, 250 to 7500 meters. American Radio and Research U.S.A., very good condition. \$1,500 U.S. plus shipping. Will bring to next SCARS meet November 19th. Bernard A. Payne. 116 Palisway Drive S.W., Calgary, Alberta T2V 3V6. Canada.

WANTED: Atwater Kent Breadboard radios, any condition, partial, basket cases, parts and literature. Paul Thompson. 315 Larkspur Drive. Santa Maria, CA 93455. (805) 934-2778.

WANTED: Cat's Paw crystal set, circa late '40's to early '50's. This was a kit with a bakelite base with antenna, ground, and earphone connections. Jesse Wayne. P.O. Box 171037. Nashville, TN 37217. (615) 361-8442.

WANTED: ARRL Handbooks, 5th edition (5-29), 8th ed. (4-31). Few 316A or VT191 tubes. Ed Phillips. 408 N. Alabama St. San Gabriel, CA 91775.

WANTED: Serious Emerson radio collector looking for a model AU-190 as pictured in *Radios* by Phil Collins, page 41. Also Emerson "Snow White" in good condition. Please contact Ray Miller, Box 306, Avalon, CA 90704, or call (213) 510-1700 collect for prompt action.

WANTED: PM23 speaker for SX-28A Hallicrafters receiver. Also four small knobs for S-20R. Frank Coxe. 19142 Glen Arran Lane. Orange, CA 92669. (714) 639-9075.

WANTED: Tone-Beam tube for Atwater Kent Model 612 console. Words "Duovac" and "Tun-A-Lite" printed on brass tube base. Sam Wrenn. 2314 Seminole. #1207. Arlington, TX 76010.

WANTED: Zenith Transoceanic, all transistor models. Multiband transistor models like Grundig, Safelit, or Nordmende Globe Trotter (mid or early '60's). Zenith Transoceanic owner's manuals, maps, etc. Harald Herp. 6615 Michele Ct. Huntington, MD 20639.

NEW MEMBERS

Arnold, Richard
August, John B.
Brardman, Ralph
Bonham, Gerald
Bresnick, Bob
Combs, Charles
Crismond, Robert
Cruddas, John W.
Eisen, Henry
Francisco, David
Glassman, Marv
Green, Charles & Mercedes
Gregory, Florence
Groshong, Richard
Hataway, Ray
Herr, George
Johnson, Richard
Mitchell, David
Monios, Nick
Nelson, Alexandria
Pederson, Tom
Porter, John & Grace
Rawski, Carolyn & Chester
Regua, Robert
Reyna, Robert
Stuettig, David
Torricelli, Alfred
Utley, Billy
Winters, Theodore
Working, Dave

ANNOUNCEMENT

The Audio Engineering Society is having an annual convention and show on November 3 to 6 at the Los Angeles Room in the Los Angeles Hilton. For information call Ron Streicher at (818) 357-1289.

PLEASE NOTE

An application balnk is enclosed. Please pass it on to a potential SCARS member.

NEW PHOTOGRAPHER

Deanna Hames has volunteered to be the SCARS photographer. If you see a young lady snooping around the meet with a camera, please welcome her with open arms. Also feel free to suggest "choice" shots to her.

NOTE

1989 quarterly meets tentatively scheduled as follows:

1. The third Saturday—
 2. February and August in Burbank
 3. May and November in Torrance.
- Mark your calendars.

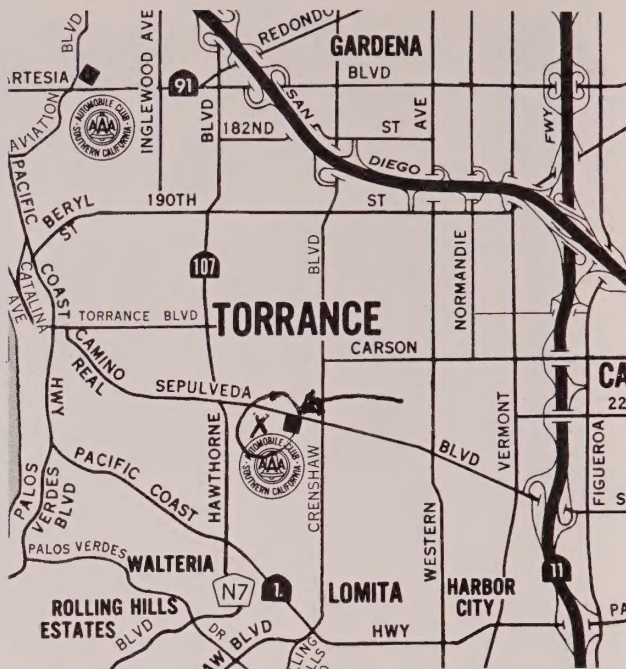
GAZETTE DEADLINES

All ads, material and articles for SCARS *Gazette*:

February issue	December 1
May issue	March 1
August issue	June 1
November issue	September 1

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NOVEMBER 19

MEETING

Velvet Turtle

**3210 W. Sepulveda Blvd.
Torrance, CA**

ANNUAL LUNCHEON

The annual luncheon will be held at the Velvet Turtle. The cost to members ordering early is \$9.95 each, including tax and tip.

Send your check to Mary Curry, Treasurer, by November 14th.

NOTICE

Anyone who occupies a chair at the annual luncheon must pay for the meal. The club is charged for each place setting.

MEMBERSHIP ROSTERS

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